LOS ALAMOS

ENVIRONMENTAL RESTORATION PROGRAM
INTERIM CHANGE NOTICE

EFFECTIVE DATE : (Dist. Date) 3/10/95 ICN No. 9 Page 1 of 1

Document No. LANL-ER-SOP-6.14 **Rev.** 0 **Title:** Sediment Material Collection

Reason for Change:

The procedure does not include a tool used in the field to collect sludge/sediment samples.

Description of Change (Specify page, paragraph, and/or section revised, and clearly write new text to be incorporated in the document).

Page 1, Section 4.0, after last paragraph on page 1 add new paragraph.

The scoop sampler technique is scoop method. The scoop portion can be a plastic beaker, jar, or other cup-type holder, which is secured to a long or extension handle by a metal cage. Usually, this sampler is constructed by field team members to meet the field requirements. The scoop sampler can be used for such things as taking samples from a septic tank or taking lagoon sludge samples from a rowboat.

Page 5, Section 8.0, add the following text

The field project leader is responsible for transmitting the sampling records to the Records Processing Facility.

Page 9, Attachment D

Add scoop sampler to the checklist.

Change Requested by:	NANCY NESS (Print)	Nancy Ness (Signature)	2/13/95 (Date)
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Los Alamos National Laboratory **Environmental Restoration Program** Standard Operating Procedure	No: LANL-ER-SOP-06.14 Rev: 0

Sediment Material Collection

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SEDIMENT MATERIAL COLLECTION

1.0 PURPOSE

This procedure describes four basic methods of sediment sample collection.

2.0 SCOPE

2.1 Applicability

This procedure is applicable to all personnel who are involved in sediment material collection for the Environmental Restoration program.

2.2 Training

All field team members involved with the sediment material collection must document that they have read and understand this procedure, as well as the procedures in Section 1.0, General Instructions.

3.0 DEFINITIONS

A. Sediments: Particles derived from rocks or biological materials that have been transported by a fluid. Sediments include solid matter (sludges) suspended in or settled from water.

B. Composite samples: Nondiscrete samples composed of more than one specific aliquot collected at various locations or at different times. Analyzing this type of sample produces an average value for the locations or time period covered by sampling.

4.0 BACKGROUND AND/OR CAUTIONS

Sediments may be watery with no cohesion and low viscosity or they may be compacted semi-solids where water is a small part of the mass. The sediment to be sampled may be many feet down at the bottom of a lake or river or it may be exposed in a dry stream bed. Because of such differences, a variety of sampling methods and equipment may be required.

Scoops and trowels provide simple, quick, and easy means of collecting a sample of a sludge or sediment. Hand corers (Attachment A) are applicable to the same situations and materials; and they have the further advantage of collecting an undisturbed sample that can profile any stratification in the sample caused by changes in the deposition. Some hand corers can be fitted with extension handles that will allow the collection of samples underlying a shallow layer of liquid. Most hand corers can also be adapted to hold liners made of brass or polycarbonate plastic. Care should be taken to choose a material that will not compromise the intended analytical procedures.

A gravity corer (Attachment B) is a metal tube with a replaceable tapered nosepiece on the bottom and a ball or other type of check valve on the top. The check valve allows water to pass through the corer on descent but prevents washout during recovery. The tapered nosepiece facilitates cutting and reduces core disturbance during penetration. Most corers are constructed of brass or steel, and many can accept plastic liners and additional weights.

Corers are capable of collecting samples of most sludges and sediments. The corers collect essentially undisturbed samples that represent the profile of strata that may develop in sediments and sludges during variations in the deposition process. Depending on the density of the substrate and the weight of the cores, penetration to depths of 75 cm (30 inches) can be attained. Care should be exercised when using gravity corers in vessels or lagoons that have liners, because penetration depths could exceed depth of substrate and result in damage to the liner material.

The Ponar grab (Attachment C) is a clamshell-type scoop activated by a counter-lever system. The shell is opened, latched in place, and slowly lowered to the bottom. When tension is released on the lowering cable, the latch releases and the lifting action of the cable on the lever system closes the clamshell.

Sediments from large surface water bodies such as streams and lakes may be taken with Ponar grab samplers from a boat. Ponar grab samplers are more applicable to a wide range of sediments and sludges because they penetrate deeper and seal better than spring activated types (e.g., Eckman dredges). Refer to equipment operations manual for use of the sampler.

Ponars are capable of sampling most types of sludges and sediments from silts to granular materials. One version has a 232-square-centimeter sample area that is light enough to be operated without a winch or crane. Penetration depths will usually not exceed several centimeters. Grab samplers are not capable of collecting undisturbed samples. As a result, material in the first centimeter of sludge cannot be separated from that at lower depths. The sampling action of these devices causes agitation currents that may temporarily resuspend some settled solids. This disturbance can be minimized by slowly lowering the sampler the last half-meter and by allowing a very slow contact with the bottom. It is advisable, however, to collect sludge or sediment samples only after all overlying water samples have been obtained.

5.0 EQUIPMEMT

Equipment required to implement this procedure is listed in Attachment D, Equipment and Supplies Checklist.

6.0 PROCEDURE

6.1 Sludge or sediment sampling using scoops or trowels

A. Insert a decontaminated scoop or trowel into material and remove sample. In the case of sludges exposed to air, it may be desirable to remove the first 1 to 2 cm of material

prior to collecting sample. Record any pertinent information, e.g., location, sample size, on the Daily Activity Log (SOP-01.01.01, Records).

B. If compositing a series of grab samples, use a decontaminated glass or stainless steel mixing bowl or Teflon™ tray for mixing.

C. Transfer sample into an appropriate sample container.

6.2 Sludge or sediment sampling using a hand corer

A. Push corer into material with smooth continuous motion, twist, then withdraw in a single smooth motion. Record any pertinent information in the Daily Activity Log.

B. Remove sample and place in an appropriate container.

6.3 Sediment and sludge sampling using a gravity corer:

A. Attach a precleaned corer to the required length of sample line. Solid braided 5 mm (3/16 inch) nylon line is sufficient; 20 mm (3/4 inch) nylon, however, is easier to grasp during hand hoisting.

B. Measure and mark distance to top of sludge on sampler line to determine depth of sludge or sediment coring.

C. Allow corer to free fall through liquid to bottom.

D. Determine depth of sludge penetration. Depending on the hardness and depth of the sediment and the weight and diameter of the corer, the corer may penetrate too far or not far enough. The amount of weight on the corer may need to be changed. Trial and error is required to find the correct weight for any given situation.

E. Retrieve corer with a smooth, continuous lifting motion. Do not bump corer because this may result in some sample loss.

F. Remove sample and place in an appropriate container. Record any pertinent information in the Daily Activity Log.

6.4 Sediment and sludge sampling using a Ponar grab sampler

A. Attach a decontaminated Ponar to the necessary length of sample line.

B. Measure and mark the distance to top of sludge on the sample line. Record depth to top of sludge and depth of sludge penetration in the Daily Activity Log.

C. Open sampler jaws until latched. From this point on, support the sampler by its lift line, or the sampler will be tripped and the jaws will close.

D. Begin lowering the sampler until the proximity mark is reached.

E. Use a slow rate of descent through last meter until contact is felt.

F. Allow sample line to slack several centimeters. In strong currents, more slack may be necessary to release mechanism.

G. Slowly raise sampler clear of surface.

H. Remove sample and place in an appropriate container.

6.5 Postoperation Activities

A. Label samples and complete sample documentation (SOP-01.04, Sample Control and Documentation).

B. Prepare the samples for shipping (SOP-01.03, Handling, Packaging, and Shipping of Samples).

C. Ensure that all equipment is accounted for, decontaminated (SOP-02.07, General Equipment Decontamination), and ready for shipment.

7.0 REFERENCES

The following procedures are directly associated with this procedure and should be reviewed before sediment sample collections:

LANL-ER SOPs in Section 1.0, General Instructions.
LANL-ER SOP-02.07, General Equipment Decontamination.

DeVera, E. R., B. P. Simmons, R. D. Stephens, and D. L. Storm. "Samplers and Sampling Procedures for Hazardous Waste Streams." EPA 600/2-80-018. January 1980.

Environmental Monitoring System Laboratory (EMSL), ORD, U.S. Environmental Protection Agency. *Characterization of Hazardous Waste Sites--A Method Manual, Volume II--Available Sampling Methods.* 1983. Las Vegas, NV.

Lind, Orent. *Handbook of Common Methods of Limnology.* C.V. Mosby Co., 1974. St. Louis, MO.

OWDC, U.S. Geological Survey, U.S. Department of the Interior. *National Handbook of Recommended Methods for Water-Data Acquisition.* Prepared cooperatively by agencies of the U.S. Government, Reston, VA. 1977.

Smith, R., and G.V. James. *The Sampling of Bulk Materials.* London: The Royal Society of Chemistry. 1981.

8.0 RECORDS

A. Completed Daily Activity Log which will include all pertinent information, e.g., location, sample size, and comments

B. Completed Chain-of-Custody/Request for Analysis Form

9.0 ATTACHMENTS

A. Diagram of Hand Corer

B. Diagram of Gravity Corer

C. Diagram of Ponar Grab Sampler

D. Equipment and Supplies Checklist

DIAGRAM OF HAND CORER

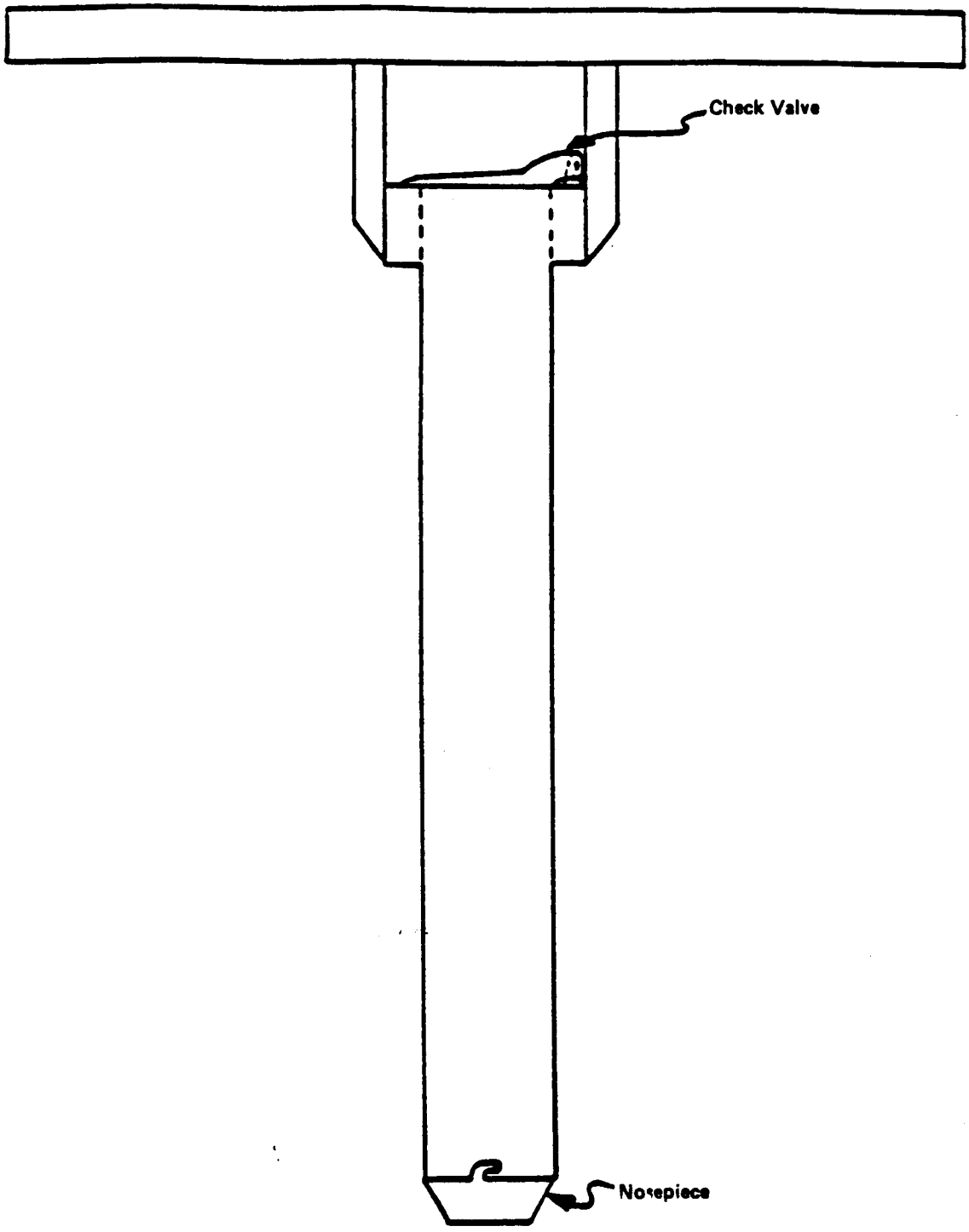


DIAGRAM OF GRAVITY CORER

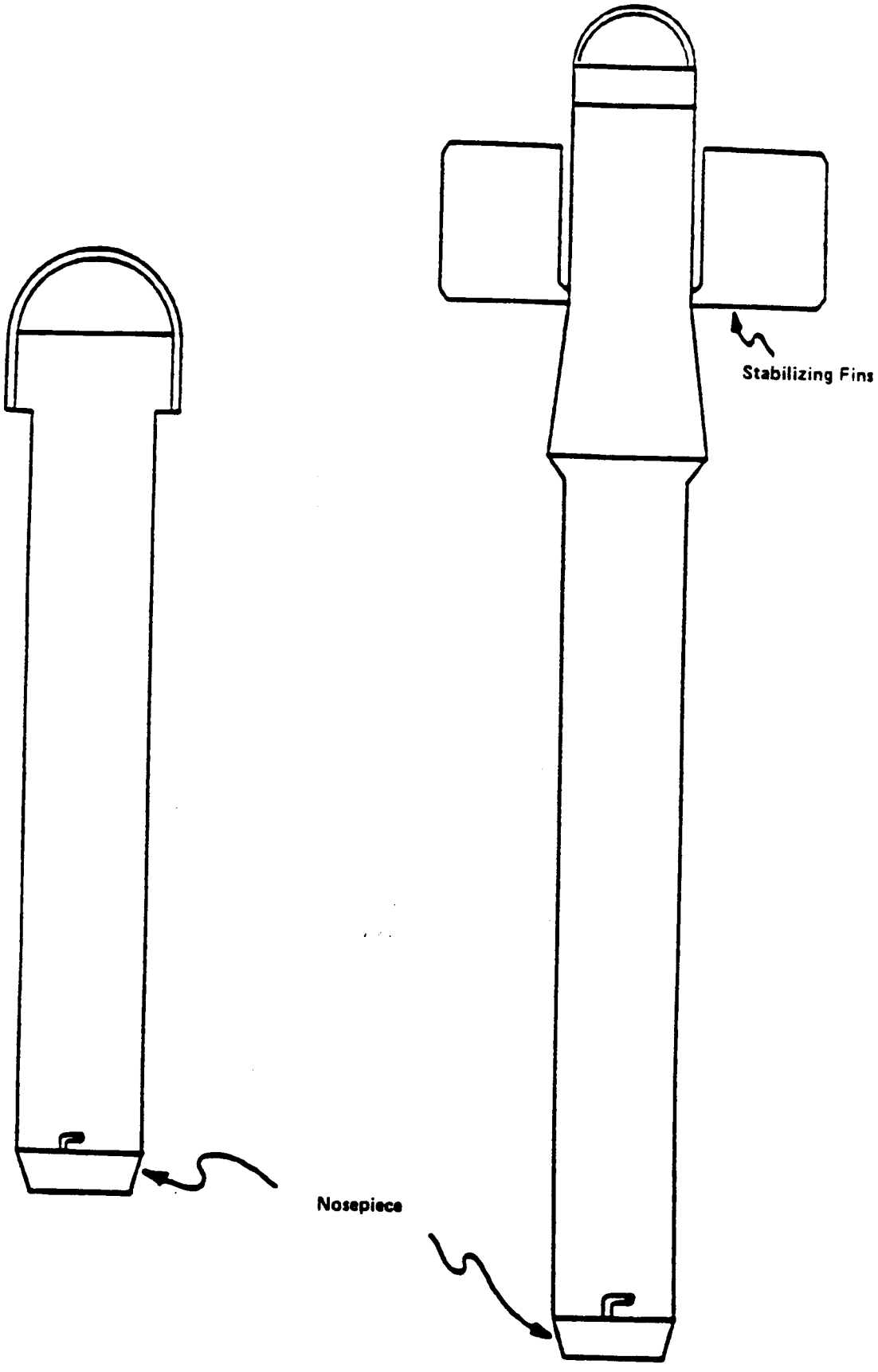
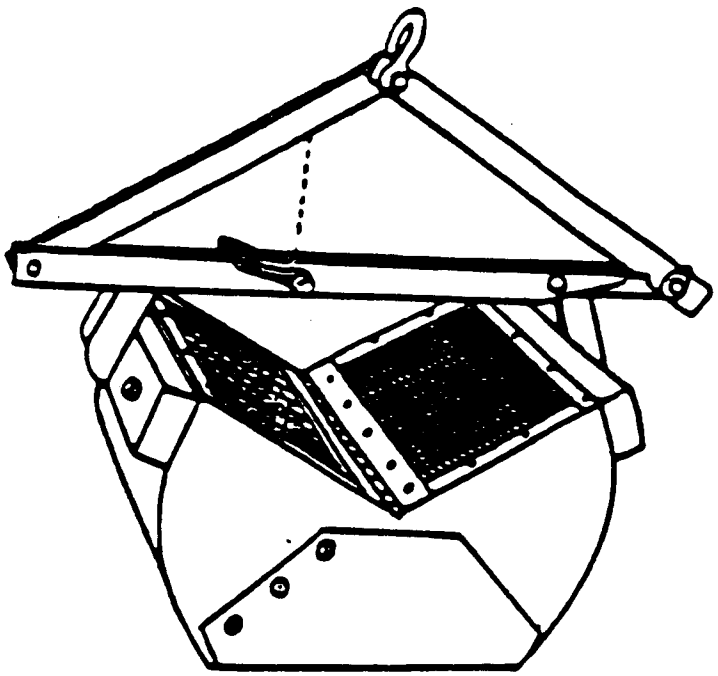


DIAGRAM OF PONAR GRAB SAMPLER



EQUIPMENT AND SUPPLIES CHECKLIST

_____ Hand Corer or

_____ Gravity Corer or

_____ Ponar Grab Sampler or

_____ Trowel or

_____ Scoop

_____ Operations manuals

_____ Bowl

_____ Tray

_____ Sample containers

_____ Rope (Review well depths prior to purchase)

_____ Protective gloves

_____ Life jacket

_____ Tape measure